

ABSTRACT

Method for developing and adapting a system for determining the location of an object in a passenger compartment of a vehicle using a variety of transducers and pattern recognition technologies and techniques that applies to any combination of transducers that provide information about vehicle occupancy. These include weight sensors, capacitive sensors, inductive sensors, ultrasonic, optic, infrared, radar among others. The adaptation process begins with a selection of candidate transducers for a particular vehicle model based on, e.g., cost, vehicle interior passenger compartment geometry, desired accuracy and reliability, vehicle aesthetics, vehicle manufacturer preferences. Once a candidate set of transducers is selected, these transducers are mounted in the test vehicle and the vehicle is subjected to an extensive data collection process wherein various objects are placed in the vehicle at various locations and various databases are collected. A pattern recognition system is developed using the acquired data and an accuracy assessment is made. Further studies are made to determine which if any of the transducers can be eliminated from the design. The design process usually begins with a surplus of sensors plus an objective as to how many sensors are to be in the final vehicle installation. The adaptation process can determine the degree of importance of the transducers and the least important could be eliminated to reduce system cost and complexity. Various data collection techniques are utilized such as collecting data under the influence of thermal gradients and the use of neural networks to insure data quality. Other techniques used include the use of pre-processors, post-processors, modular networks, large databases and multiple databases.